High-content screening of primary neurons: ready for prime time.

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Public Summary:

Scientific Abstract:
High-content screening (HCS), historically limited to drug-development companies, is now a powerful and affordable technology for academic researchers. Through automated routines, this technology acquires large datasets of fluorescence images depicting the functional states of thousands to millions of cells. Information on shapes, textures, intensities, and localizations is then used to create unique representations, or 'phenotypic signatures,' of each cell. These signatures quantify physiologic or diseased states, for example, dendritic arborization, drug response, or cell coping strategies. Live-cell imaging in HCS adds the ability to correlate cellular events at different points in time, thereby allowing sensitivities and observations not possible with fixed endpoint analysis. HCS with live-cell imaging therefore provides an unprecedented capability to detect spatiotemporal changes in cells and is particularly suited for time-dependent, stochastic processes such as neurodegenerative disorders.